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ASSOCIATION OF INSULIN RESISTANCE TRAJECTORY OVER 25 YEARS WITH LEFT VENTRICULAR SYSTOLIC AND DIASTOLIC FUNCTION IN MIDDLE-AGED ADULTS: THE CORONARY ARTERY RISK DEVELOPMENT IN YOUNG ADULTS (CARDIA) STUDY

Poster Contributions
Hall C
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Background: We studied whether the association of young adult insulin resistance (IR) trajectories to midlife subclinical left ventricular (LV) dysfunction differs in non-obese vs obese individuals.

Methods: CARDIA enrolled black and white adults from 4 US centers in 1985-86 (Y0). We included 2918 participants with data at both baseline and follow up exams, excluding pregnancy and treated diabetes at any exam. The Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) measured at 5 follow-up exams over 25 years was used to broadly classify all individuals into 3 trajectory groups: group 1 (Low IR) - those with persistently low HOMA-IR; group 2 (moderate IR) - those with moderate HOMA-IR with or without some increase over 25 years; and group 3 (High IR) - those with persistently high HOMA-IR with or without an increase. Longitudinal systolic strain (Ell) and early diastolic strain rate (Ell_SRe) at the Y25 was assessed by speckle tracking echocardiography (STE). Multivariable linear regression models investigated the association of IR trajectories with LVEF, Ell, and Ell_SRe, within non-obese and obese, adjusting for Y25 risk factors.

Results: The Table shows LV functional indices for each IR trajectory by Y25 obesity status. Those without obesity and with High IR had significantly lower Ell and Ell_SRe than those non obese with low IR. High IR in the non-obese had similar LV function to the obese.

Conclusions: Having high IR over 25 years in the non-obese was associated with differences in LV strain at midlife.

Table. Left ventricular ejection fraction, longitudinal peak systolic strain, and longitudinal early diastolic strain rate of the trajectory by insulin resistance, The CARDIA Study (n=2,918).

IR Trajectories	Y0 Mean HOMA-IR	Y25 Mean HOMA-IR	LVEF (%), n=2,720		Ell (%), n=2,570		Ell_SRe (sec-1), n=2,560	
			Non obese n=1,670 (61.4%)	Obese n=1,050 (38.6%)	Non obese n=1,575 (61.3%)	Obese n=995 (38.7%)	Non obese n=1,568 (61.3%)	Obese n=992 (38.7)
Group 1 (Low IR)¶, n=1,230	1.28	1.14	61.7 (0.2)	61.2 (0.6)	-15.6 (0.1)*	-14.9 (0.2)	0.85 (0.01)	0.83 (0.02)
Group 2 (Moderate IR)¶, n=1,375	1.62	2.96	61.5 (0.3)	61.6 (0.3)	-15.3 (0.1)*§	-14.8 (0.1)	0.83 (0.01)	0.81 (0.01)
Group 3 (High IR)¶, n=313	2.66	6.59	62.1 (1.1)	59.9 (0.5)	-14.6 (0.4)§	-14.5 (0.2)	0.74 (0.04)‡	0.79 (0.02)

Mean (standard error). Obesity was defined as body mass index ≥30.0 kg/m^2.
*p<0.05, †p<0.005 vs. Obese; ‡p<0.05, §p<0.005 vs. Low IR.
¶ Group 1 (Low IR) – persistently low HOMA-IR; Group 2 (moderate IR) –moderate HOMA-IR with or without an increase; and Group 3 (High IR) – high HOMA-IR with or without an increase.
Model adjusted for age, sex, race, educational level, physical activity, alcohol intake, smoking, use of antihypertensive medication, systolic blood pressure, heart rate, diabetes, and obesity at Year 25 exam.
HOMA-IR=Homeostasis Model Assessment of Insulin Resistance; IR= insulin resistance; LVEF=left ventricular ejection fraction; Ell=longitudinal peak systolic strain; Ell_SRe=longitudinal early diastolic strain rate.